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10/781,362	02/18/2004	David Ginsburg	UM-08901	2770

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EXAMINER

SITTON, JEHANNE SOUAYA

ART UNIT	PAPER NUMBER
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1634

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/29/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/781,362

Applicant(s)

GINSBURG ET AL.

Examiner

Jehanne S. Sitton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) .
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 17-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/12/2006. In response to the statements made at the last paragraph of page 5 of the response, it is noted that no species election was set forth in the previous restriction requirement.

Specification

2. The amendment filed 8/23/2004 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the preliminary amendment filed 8/23/2004 added SEQ ID NOS to the specification which do not appear to have support in the original disclosure. No sequence listing was filed with the instant application nor in provisional application 60/448,264. Although the drawings appear to provide support for SEQ ID NO: 1, 2, and 19, and various nucleotide oligomers are set forth in the specification, the sequence listing contains additional sequences which were not submitted with the application at the time of filing. Although table 1 refers to specific SEQ ID NOS, those sequences were not provided with the application at the time of filing. Additionally, it appears that SEQ ID NOS 29-31 were submitted for figure 4b, however the figure only contains a single sequence. Accordingly, the sequence listing and the amendment to the specification on page 6 to refer to SEQ ID NOS 29-31 appears to introduce new matter into the specification. Other than providing a statement that the paper

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copy and the computer readable form are the same, the response accompanying the amendment filed 8/23/2004 provides no explanation for the specific contents of the sequence listing, nor any statement pertaining to the inclusion of new matter. Applicant is required to cancel the new matter in the reply to this Office Action or to provide detailed explanation regarding support in the originally filed disclosure for each new sequence.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 12-16 and 20 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. There are many factors to be considered when determining whether there is sufficient evidence to support determination that a disclosure does not satisfy the enablement requirements and whether any necessary experimentation is undue. These factors have been described by the court in *In re Wands*, 8 USPQ2d 1400 (CA FC 1988). *Wands* states at page 1404,

“Factors to be considered in determining whether a disclosure would require undue experimentation have been summarized by the board in *Ex parte Forman*. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of

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those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.”

The nature of the invention and the breadth of the claims:

The specification defines the recitation of “MCFD2” as a protein or nucleic acid, that in some mutant forms, is correlated with factor V or factor VIII deficiency (F5F8D) (page 9, lines 20-24). Claims 12-16, and 20 are drawn broadly drawn to encompass methods for detecting broadly “any” variant MCFD2 polypeptides in any subject, including any variants which are correlated with or indicative of F5F8D. The claims encompass methods which detect any polypeptide variant or nucleotide variation in the MCFD2 gene which encode a variant MCFD2 polypeptide, including any C-terminal truncation of SEQ ID NO: 2 (claim 13), or is “associated with a variant MCFD2 polypeptide”, for example nucleotide variations which do not encode a variant polypeptide (claim 20). The claims further encompass methods of detecting variant MCFD2 polypeptides or nucleic acids in any subject, such as any animal, which includes, for example, any mammal such as dog, cat, mouse, rat, horse, etc. The claims do not define the identity or position of the polypeptide or nucleotide variation.

The invention is in a class of inventions which the CAFC has characterized as 'the unpredictable arts such as chemistry and biology' (Mycolgen Plant Sci., Inc. v. Monsanto Co., 243 F.3d 1316, 1330 (Federal Circuit 2001)).

The amount of direction or guidance and presence and absence of working examples:

The specification at page 1, teaches that F5F8D is associated with bleeding tendency and plasma levels of FV and FVIII in the range of 5-30%. The specification teaches that this disease

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is autosomal recessive, representing a condition distinct from coinheritance of both FV deficiency (parahemophilia), and FVIII deficiency (classic hemophilia, hemophilia A). The specification teaches that mutations in LMAN1, which encodes the endoplasmic reticulum-Golgi intermediate compartment type I membrane protein ERGIC-53, account for the majority of patients with F5F8D, but that families with the disease were found who lacked LMAN1 mutations.

The specification teaches the genomic sequence comprising multiple coagulation factor deficiency 2, MCFD2 in humans, (SEQ ID NO: 19), as well as the coding sequence (SEQ ID NO: 1), and the polypeptide (SEQ ID NO: 2). The specification also teaches 7 mutations that were identified in human patients having F5F8D (see Table 1, page 95: 149+5 G>A, 309+1 G>A, 103delC, 249DelT, 263-270delTTGATGGC, C387>G, and T407>C). Although table 1 references specific SEQ ID NO: with regard to the mutations, the position of these mutations in SEQ ID NOS 1, 2, and 19 is unclear. The specification does not teach the gene or polypeptide sequence of MCFD2 in any other animal, nor does it teach any MCFD2 variants from other species.

The specification teaches that 3 of the mutations resulted in frameshift mutations, two mutations were in splice sites, and 2 mutations resulted in amino acid substitutions (D129E and I136T) (page 94). The specification teaches that the two amino acid substitutions were located in a putative EF hand and were excluded as a common sequence polymorphism in a screen of over 200 unaffected chromosomes.

The specification does not teach the specific function of MCFD2, but teaches that the amino acid sequence includes a predicted signal peptide at the N terminus, and two calmodulin-

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like EF hands for putative Calcium binding at the C-terminus (page 94). The specification teaches that the D129E mutant and I136T mutant displayed diffuse staining patterns in cells as opposed to wildtype MCFD2 which overlapped with LMAN1 (page 97). The specification also teaches that in vitro studies found that MCFD2 interacts with LMAN1 in a calcium dependent manner (page 98). However, other than identifying the specific variants set forth in table 1, the specification does not teach which additional amino acids in MCFD2 would be expected to be associated with F5F8D, nor how any variants, other than the 2 missense mutations, would be expected to alter the function, or activity of MCFD2.

Additionally, the claims broadly encompass detection of variant polypeptides using differential antibody binding. Although the specification teaches that antibodies were generated against full length his-tagged MCFD2, the specification does not teach any antibodies which were able to specifically bind to any of the variant MCFD2 polypeptides.

The state of the prior art and the predictability or unpredictability of the art:

The art of identifying novel MCFD2 variant nucleic acids or polypeptides which are sufficiently correlated with or indicative of F5F8D is highly unpredictable. Knowledge of the sequence of the wildtype MCFD2 gene does not allow one to immediately envision additional mutations in that are associated with disease. At the time the invention was filed, the art was silent with regard to MCFD2 function, or F5F8D mutations, other than work published which included the instant inventors and summarized the teachings of the instant specification (Zhang et al; "Zhang I"; Blood, vol 100, No. 11, abstract 1; November 2002).

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The specification does not teach a predictable means for identifying additional variations associated with MCFD2 or for distinguishing between variations associated with MCFD2 and naturally occurring polymorphisms. While the specification teaches specific mutations which exhibited diffuse staining patterns in the cell and appeared to be associated with a lack of MCFD2/LMAN1 co-immunoprecipitation, without extensive information regarding the structure-function relationship between MCFD2, LMAN1, and F5F8D, it is highly unpredictable as to what would be the identity of additional mutant, allelic, or splice variants which would be associated with F5F8D. Thus, one cannot readily anticipate the effect of a polymorphism or mutation within the MCFD2 gene.

The level of skill in the art:

The level of skill in the art is deemed to be high.

The quantity of experimentation necessary:

The specification teaches 7 variants in the MCFD2 gene which were found in patients with F5F8D. However, the MCFD2 gene is large, comprising about 23Kb, spanning 4 exons. To identify additional variants of the MCFD2 gene which are associated with F5F8D would require extensive experimentation. For example, such experimentation may involve sequencing the MCFD2 gene of affected individual, sequencing the MCFD2 gene of control individuals which do not have F5F8D or a family history of F5F8D, comparing the sequences of these two groups, and then identifying variations which are present only in the affected group and not in the control group. Such random, trial by error experimentation is considered to be undue. While methods

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for sequencing genes are known in the art, such methods provide only the general guidelines that allow researchers to randomly search for mutations that may be linked to a disease. The results of performing such methodology is highly unpredictable. The specification has provided only an invitation to experiment. The specification does not provide a predictable means for identifying additional variants of the MCFD2 gene, in any animal, which are correlated with or indicative of F5F8D, as is broadly encompassed by the pending claims.

The claims broadly encompass detection of variant polypeptides using differential antibody binding. Neither the prior or postfiling date art, or the specification, teach an antibody that is capable of specifically differentiating the MCFD2 variants or specifically binding to any of the variants set forth in table 1. It is unpredictable whether the amino acid change would be sufficient to result in the production of antibodies that can differentiate between the two molecules. In some cases, an antibody elicited by one antigen can cross-react with a different antigen if the two different antigens share an identical or very similar epitope (Goldsby et al., Immunology; 2003, p. 141). Thus, absent knowledge of the binding epitopes and the effects of the instant polymorphism on those epitopes, it is difficult to predict whether or not any generated antibody will be able to function to differentiate the two alleles in an assay. In the instant case, it is unpredictable as to whether or not an antibody would be able to differentiate between the variants, a feature that is encompassed by the claimed invention.

Case law has established that '(t)o be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'" *In re Wright* 990 F.2d 1557, 1561. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970) it was determined that '(t)he scope of the claims must bear a

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reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art". The amount of guidance needed to enable the invention is related to the amount of knowledge in the art as well as the predictability in the art. Furthermore, the Court in *Genetech Inc. v Novo Nordisk* 42 USPQ2d 1001 held that "(I)t is the specification, not the knowledge of one skilled in the art that must supply the novel aspects of the invention in order to constitute adequate enablement".

In the instant case, the claims do not bear a reasonable correlation to the scope of enablement because the specification teaches 7 mutations within the significantly large MCFD2 gene which are associated with F5F8D. The specification does not teach a representative number of additional variants, including insertions, deletions, substitutions or splice variants, or gross chromosomal rearrangements which are associated with F5F8D. Accordingly, although the level of skill in the art of molecular biology is high, given the lack of disclosure in the specification and in the prior art and the unpredictability of the art, it would require undue experimentation for one of skill in the art to make and use the invention as broadly claimed.

5. Claims 12-16 and 20 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This includes a New Matter Rejection.

The specification defines the recitation of "MCFD2" as a protein or nucleic acid, that in some mutant forms, is correlated with factor V or factor VIII deficiency (F5F8D) (page 9, lines

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20-24). Claims 12-16, and 20 are drawn broadly drawn to encompass methods for detecting broadly “any” variant MCFD2 polypeptides in any subject, including any variants which are correlated with or indicative of F5F8D. The claims encompass methods which detect any polypeptide variant or nucleotide variation in the MCFD2 gene which encode a variant MCFD2 polypeptide, including any C-terminal truncation of SEQ ID NO: 2 (claim 13), or is “associated with a variant MCFD2 polypeptide”, for example nucleotide variations which do not encode a variant polypeptide (claim 20). The claims further encompass methods of detecting variant MCFD2 polypeptides or nucleic acids in any subject, such as any animal, which includes, for example, any mammal such as dog, cat, mouse, rat, horse, etc. The claims do not define the identity or position of the polypeptide or nucleotide variation.

The specification teaches 7 mutations that were identified in human patients having F5F8D (see Table 1, page 95: 149+5 G>A, 309+1 G>A, 103delC, 249DelT, 263-270delTTGATGGC, C387>G, and T407>C). Although table 1 references specific SEQ ID NO: with regard to the mutations, the position of these mutations in SEQ ID NOS 1, 2, and 19 is unclear. The specification does not teach the gene or polypeptide sequence of MCFD2 in any other animal, nor does it teach any MCFD2 variants from other species. The specification does not disclose and fully characterize the genus required by the claims of any variation in the MCFD2 gene from any species.

Vas-Cath Inc. V. Mahurkar, 19 USPQ2d 1111, clearly states that “applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the ‘written description’ inquiry, whatever is now claimed”. Applicant is reminded that *Vas-Cath* makes clear that the written

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description provision of 35 U.S.C. 112 is severable from its enablement provision. In *The Regents of the University of California v. Eli Lilly* (43 USPQ2d 1398-1412), the court held that a generic statement which defines a genus of nucleic acids by only their functional activity does not provide an adequate written description of the genus. The court indicated that while Applicants are not required to disclose every species encompassed by a genus, the description of a genus is achieved by the recitation of a representative number of DNA molecules, usually defined by a nucleotide sequence, falling within the scope of the claimed genus. At section B(1), the court states that "An adequate written description of a DNA... requires a precise definition, such as by structure, formula, chemical name, or physical properties', not a mere wish or plan for obtaining the claimed chemical invention".

In analyzing whether the written description requirement is met for a genus claim, it is first determined whether a representative number of species have been described by their complete structure. In the instant case, 7 members of the genus of MCFD2 nucleotide variations have been identified. No additional nucleotide variations have been disclosed. It is then determined whether a representative number of species have been sufficiently described by other relevant identifying characteristics (e.g. restriction map, biological activity of an encoded protein product, etc.). In the instant case, no such identifying characteristics have been provided for any of allelic variants or mutant MCFD2 nucleic acids or polypeptides, including in any species. However, the claims as written are inclusive of a potentially large genus of mutations in the MCFD2 gene from any species, including humans.

Further, the claims encompass mutations in the MCFD2 gene correlated with or indicative of F5F8D, which represent a distinct group of nucleotide variations which are

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expected to occur at only specific locations within the gene and consist of specific nucleotide alterations. Accordingly, knowledge of the sequence of the wild-type gene does not allow the skilled artisan to envision all of the contemplated polymorphisms encompassed by the claimed genus. Conception of the claimed invention cannot be achieved until reduction to practice has occurred, regardless of the complexity or simplicity of potential methods for isolating additional nucleotide variations. As stated in *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (CAFC 1993) and *Amgen Inc. V. Chugai Pharmaceutical Co. LTD*, 25 USPQ2d 1016, one cannot describe what one has not conceived. Additional MCFD2 variants have been taught in the postfiling date art, which have not been taught or described in the instant specification (see “Zhang II”; Zhang et al; Blood, vol. 107, pages 1903-1907, 2006; Table 1: -6-IG>C and D89A).

The genus encompassed by the claims includes an enormous number of polymorphisms and mutations for which no written description is provided in the specification. The disclosure in the specification of 7 mutations MCFD2 gene is not considered to constitute a representative number of nucleotide variants, including insertions, deletions, substitutions or splice variants, in any exon, intron or non-coding region of MCFD2 or gross chromosomal rearrangements in the MCFD2, including those which are associated with F5F8D because it is not clear which mutations would have the same affect. Further the claims encompass analysis of sequences that have not been taught or described by the specification, including sequences not known in the art at the time the invention was filed (claim 16). No common element or attributes of the sequences are disclosed which would permit selection of sequences as variants. No structural limitations or requirements which provide guidance on the identification of sequences which meet these functional limitations of associating a variant with F5F8D is provided.

Applicants attention is drawn to the Guidelines for the Examination of Patent Applications under 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 2001. In analysis of the claims for compliance with the written description requirement of 35 U.S.C. 112, first paragraph, the written description guidelines note regarding genus/species situations that "Satisfactory disclosure of a "representative number" depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species disclosed." (See: Federal Register: December 21, 1999 (Volume 64, Number 244), revised guidelines for written description.) In the instant case, the specification fails to teach the necessary common attributes or features of the genus of encompassed polypeptides, nucleic acids and variants in view of the species disclosed. As such, one of skill in the art would not recognize that applicant was in possession of the genus of variants encompassed by the broadly claimed invention.

Additionally, claim 20 has been amended to recite "wherein said detecting comprises detecting a variant MCFD2 nucleic acid sequence associated with said variant MCFD2 polypeptide". The recitation of "associated" appears to broadly encompass not only specific nucleic acid mutations which encode for amino acid changes in the MCFD2 protein, but also to nucleotide variants which do not encode amino acid changes but may be found in the same sequence, for example, in a haplotype, with a particular nucleotide variant encoding a variant MCFD2 polypeptide. The specification has been thoroughly reviewed but does not appear to provide support for the latter concept. The specification does not teach or describe any nucleotide variants which do not result in a change in the amino acid sequence of MCFD2.

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6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 16 and 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16 recites the term “young” in reference to an animal. However the term is indefinite because neither the claim nor the specification provide any guidance to ascertain the metes and bounds of the term.

Claim 20 has been amended to recite “wherein said detecting comprises detecting a variant MDFD2 nucleic acid sequence associated with said variant MCFD2 polypeptide”. The recitation of “associated” is indefinite as it is unclear if the term is limited to nucleotide variations which specifically encode amino acid changes, or whether the term is intended to more broadly encompass any variant in a nucleotide sequence which can also be found in a nucleotide sequence which encodes a variant polypeptide, for example a single nucleotide polymorphism which occurs in a haplotype including nucleotide variants that encode specific amino acid changes. The specification does not define the terms and therefore the metes and bounds of the term are unclear.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claims 12-16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang I (Zhang et al; Blood, vol 100, No. 11, abstract 1; November 2002).

Zhang I teaches detecting variant MCFD2 (CFD2) polypeptides and nucleic acids in a sample from patients with F5F8D. With regard to claim 13, although Zhang I does not teach that certain mutations resulted in a C terminal truncation, as the reference is applicant's own work, the PTO has basis for believing that the reference anticipates the claims. As stated in the MPEP in chapter 2100:

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genbank Accession number NM_139279 (May 31, 2002).

The claims are directed to detecting the “presence or absence” of a variant MCFD2 polypeptide. As evidenced by dependent claim 20, the claims encompass detection of a nucleic acid sequence. Further, the recitation of detecting the “absence” of a variant MCFD2, encompass detection of the presence of the wildtype sequence. Genbank Accession number NM_129279 teaches the sequence of SDNSF from humans, which encodes an enzyme which is identical to SEQ ID NO: 2, and therefore detects “the absence” of the variant polypeptide. Although the Accession number does not specifically teach “providing a biological sample from a subject”, the accession number teaches that the sequence was isolated from heart tissue (claim 15). Further, although the accession number does not specifically teach that the gene was sequenced, the accession number teaches the sequence, therefore it would be obvious to the ordinary artisan at the time the invention was made to isolate the molecule from a biological sample from a subject and perform a sequencing reaction, which techniques were routine in the art at the time of the invention, to determine the sequence of the molecule.

13. Claims 12, 13, 15, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Genbank Accession number NM_139279 in view of Echelard (Echelard et al; 6,210,736).

Genbank Accession number NM_129279 teaches the sequence of SDNSF from humans,

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which encodes an enzyme which is identical to SEQ ID NO: 2. The accession number teaches that the sequence was isolated from heart tissue (claim 15). The accession number does not teach any MCFD2 polypeptide variants, however Echelard teaches that mutagenesis of DNA which encodes a protein or a particular domain can be prepared by random mutagenesis (col. 22, lines 31-38). Echelard teaches that techniques can be used to create variants such as deletions (claim 13). Echelard teaches that mutagenesis can be conducted at a target codon or region to screen variants for optimal combination of desired activity (col. 23, lines 49-51). Therefore, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to produce variants of MCFD2, as taught by Echelard. The ordinary artisan would have been motivated to produce variants of MCFD2 as taught by Accession number NM_129279, for the purpose of producing variants with optimal combination of a desired activity as taught by Echelard.

Conclusion

14. No claims are allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Jehanne Sitton whose telephone number is (571) 272-0752. The examiner can normally be reached Monday-Thursday from 8:00 AM to 5:00 PM and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached on (571) 272-0735. The fax phone number for this Group is (571) 273-8300.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.



Jehanne Sitton
Primary Examiner
Art Unit 1634

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